

## Abstract Of The Disclosure

Two intake valves are independently operated by electro-mechanical actuators and activated by the engine electronic controller. One tumble-type intake  
5 valve and one conventional intake valve are provided in each cylinder. The valve members are individually opened and closed to achieve a desired air flow pattern in the combustion chamber to optimize combustion which increases fuel economy and reduces undesirable  
10 emissions. The opening and closing of the valve members depends on the engine speed, engine load, and other factors.